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COMPLETE SPECIFICATION.

Improvements in or relating to Photographic Shutters.

(A communication from Heinrich Ernemann, Directing Manager of Schandauerstrasse 48, Dresden—A, in the Kingdom of Saxony, Empire of Germany.)

I, Alfred Julius Boult, of 111, Hatton Garden, in the County of London, Chartered Patent Agent do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to that class of photographic shutter known as roller-blind shutters with the blind made in two parts, in which the width of the slot can be adjusted from the outside in the following manner: The edge of one half blind is provided with bands or strings passing through eyes on the edge of the second half blind, which cords or strings are secured to pulleys arranged at both ends of the roller for the first half blind in such manner that when the shutter is working they rotate together with the roller, but when the width of the slot is being adjusted they are turned relatively to the roller, which remains stationary. This invention refers particularly to such a shutter in which the common spindle of the roller and of the two pulleys is at the same time used for adjusting the pulleys from the outside after they have been uncoupled from the roller by being moved in longitudinal direction.

As in the shutter according to this invention the roller arranged between the pulleys has no handle projecting outside by means of which it could be held fast during the adjustment of the pulleys, the spindle of the roller uncoupled must be fixed during the adjustment, in some other way. This in one of the objects of this invention and is attained by a part which is non-rotatable and which is connected with the longitudinally movable spindle, engaging with a part connected to the roller. It is preferable to use a perforated or toothed disc or flange connected with the roller and a pin connected with the spindle and engaging with the holes or notches in the said disc.

The invention further relates to a device for indicating the width of the slot, which is moved together with the pulleys, but is not affected by the rotation of the spindle during the working of the shutter. For this purpose the movable spindle is provided with an absolutely fixed pinion permanently engaging with a dial or with a toothed wheel connected to a pointer, but which is coupled to the spindle only when the latter is moved longitudinally whereby the roller is uncoupled.

The invention finally relates to means for uncoupling the winding device from the spindle during the adjustment of the pulleys, so that the spindle can be rotated in either direction.

A roller blind shutter according to this invention is illustrated in the accompanying drawing, in which Fig. 1 is an elevation, partly in section, Figs. 2 and 3 are respectively left and right hand end views, Fig. 4 shows separately, on an enlarged scale, the perforated disc on the spindle and Figs. 5 and 6 show in longitudinal and cross section the left hand end of the spindle, with the coupling for the pinion of the indicator.

[*Price* 8*d*.]

The upper half 1 of the blind is secured to the roller 2 and provided at its free edge with a wire stiffening 3. The lower half of the blind is secured at one end to a roller 5 provided in the usual manner with a spring for the purpose of rolling up the blind made in two halves after the shutter has been released. Bands 6 pass through eyes 7 in a corresponding wire stiffening of the half blind 4, through the eyes 3 to pulleys 8 to which they are secured. The left hand pulley 8 engages by means of a cylindrical extension 9 with the left hand end of the roller 2. The spindle 11 which is movable longitudinally against the action of a spring 10 within the roller is provided with two spring keys 12, by means of which the pulleys 8 can be caused to participate in the rotation of the spindle in any position. The right hand spring key causes, as long as the spindle is in its left hand position shown in the drawing, the roller 2 to participitate in the rotation, but when the spindle is shifted to the right, said key becomes disengaged from the end of the roller 2 so that the roller becomes uncoupled, and only the pulleys are rotated when the spindle is turned. The shifting of the spindle 11 is effected by pressing on a knob 13, and the spindle is rotated by turning the knob 14.

In order to secure the uncoupled roller 2 in its position during the adjustment of the pulleys 8, a disc 15 is secured to the left hand end of the roller. As shown in Figure 4 the disc 15 is provided with a number of small holes in a circle, which could also be replaced by notches so as to give the disc an appearance of a toothed wheel. When the spindle 11 is moved to the right a pin 16 connected to the spindle by means of a fork 17 engaging in a circular groove in the knob 13 (Fig. 6) enters one of the holes or notches of the disc. When the blind 1 is rolled up, the wire 3 engages with the recess 18 (Fig. 4) of the disc 15 so that the blind 1 can be wound up uniformly in spite of the disc 15.

When the roller 2 is fixed in the described manner by moving the spindle 11 to the right, the spindle may be rotated with the fingers of the right hand in either direction by means of the knob 14, in order to alter the width of the slot by rolling up or unrolling the bands. During this operation a finger of the left hand presses on the knob 13 in order to maintain the spindle 11 in its right hand position. As soon as this finger is removed, the spring 10 causes the spindle 11 to return to its left hand position, and the roller 2 is again coupled to the spindle by means of the spring key 12.

As during this operation a toothed wheel 20 of the well known winding device engages with the fixed pinion 19 which is also connected with the movable spindle by means of a spring key, and a pawl 22 engages with a ratchet wheel 21 on the spindle of the wheel 20, the spindle 11 can turn only in one direction. In order to enable it to be rotated in the other direction, the pawl 22 must be disengaged. This is effected by means of a bell crank lever 23, 24, the arm 23 of which drops off the neck of the knob 14 when the spindle is shifted to the right, and approaches towards the axis of the spindle 11, the arm 24 thereupon disengaging the pawl 22 by engaging with a pin 25 thereon. On the bell crank acts a strong spring 26 which overcomes the weaker spring 27 of the pawl 22. When the spindle 11 returns to the left hand side, the arm 23 rises again, its bevelled surface riding upon the enlarged part of the spindle (Fig. 1).

The slot width indicator could be constituted by a hand moving over a dial. It is however preferable to have it made in the form of a disc 28, indicating the width of slot in millimetres or fractions of an inch, said disc rotating behing a plate 30 provided with an annular slot 29. A gear wheel 31 engages with the toothed edge of the disc 28. The wheel 31 is mounted on the spindle 11 by means of a spring sleeve 32 provided with longitudinal slots. The gear wheel and sleeve are fixed together and are coupled with the spindle 11 when the latter is moved to the right, the conical bore in the knob 13 (Fig. 6) compressing the slotted sleeve and pressing it against the spindle so as to make a frictional engagement. The indicator device is therefore rotated only when the spindle 11 with the pulleys is rotated after having been moved to the right, while during the ordinary working of the shutter the indicator remains in the position indicating the width of the slot effected at the last adjustment. In order to prevent accidental turning of the disc 28, it is provided with a spring brake 33. The friction coupling constituted by the conical bore of the knob 13 and the slotted sleeve 32 may be replaced by some other coupling.

Having now particularly described and ascertained the nature of the said invention as communicated to me by my foreign correspondent, and in what manner the same is to be performed, I declare that what I claim is:—

1. In a roller blind shutter with adjustable slot, means for securing the winding roller inaccessible from the outside in uncoupled position, said means being actuated when the roller spindle is longitudinally shifted to effect the uncoupling of the roller.

2. In a roller blind shutter of the kind described the arrangement of a perforated or notched disc on the roller and the arrangement on the movable spindle 11 of a pin for engaging said disc to secure the roller when uncoupled.

3. In a roller blind shutter of the kind described a pinion such as 31 mounted on the roller spindle for the purpose of driving the device for indicating the width of the slot, said pinion being coupled with the roller spindle when the latter is longitudinally moved to effect the uncoupling of the roller but is at other times loose on the spindle.

4. In a roller blind shutter of the kind described a coupling between the roller spindle and the indicator operating pinions constituted by a slotted spring sleeve on the pinion adapted to be compressed on to the spindle by a conically bored part of the knob employed when the spindle is longitudinally shifted.

5. In a roller blind shutter of the kind described a slot width indicating device constituted by a rotatable dial arranged behind a slotted indicator plate substantially as described.

6. In a roller blind shutter of the kind described a bell crank lever such as 23, 24 and a pawl on the blind winding device adapted to release the latter when the roller spindle is shifted to uncouple the roller substantially as described.

7. The complete mechanism for altering or altering and indicating the width of slot in a roller blind shutter substantially as described or illustrated in the accompanying drawings.

Dated this 10th day of February, 1903.

BOULT WADE & KILBURN
Agents for the Applicant.

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BOULT'S COMPLETE SPECIFICATION.

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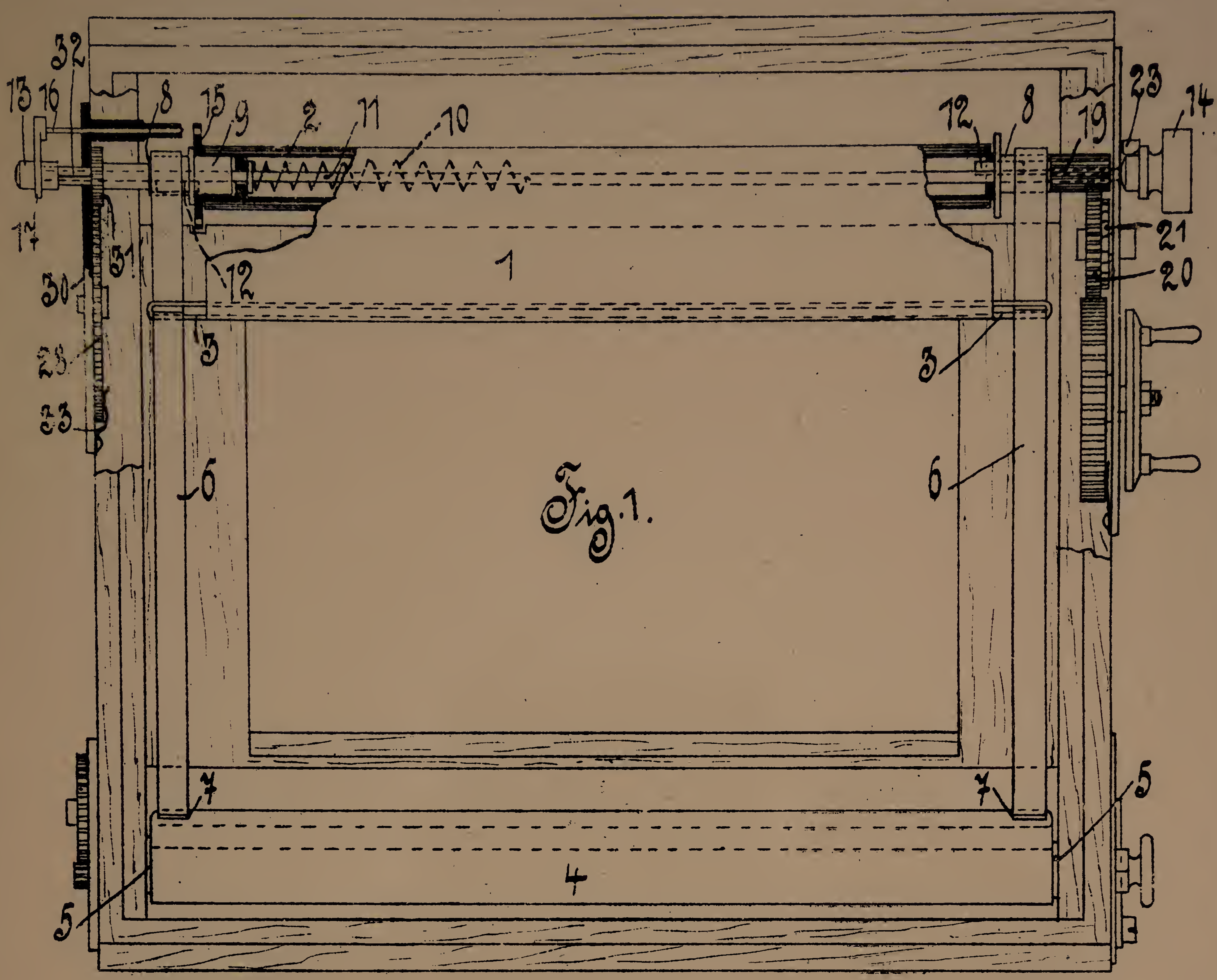


Fig. 1.

Fig. 2.

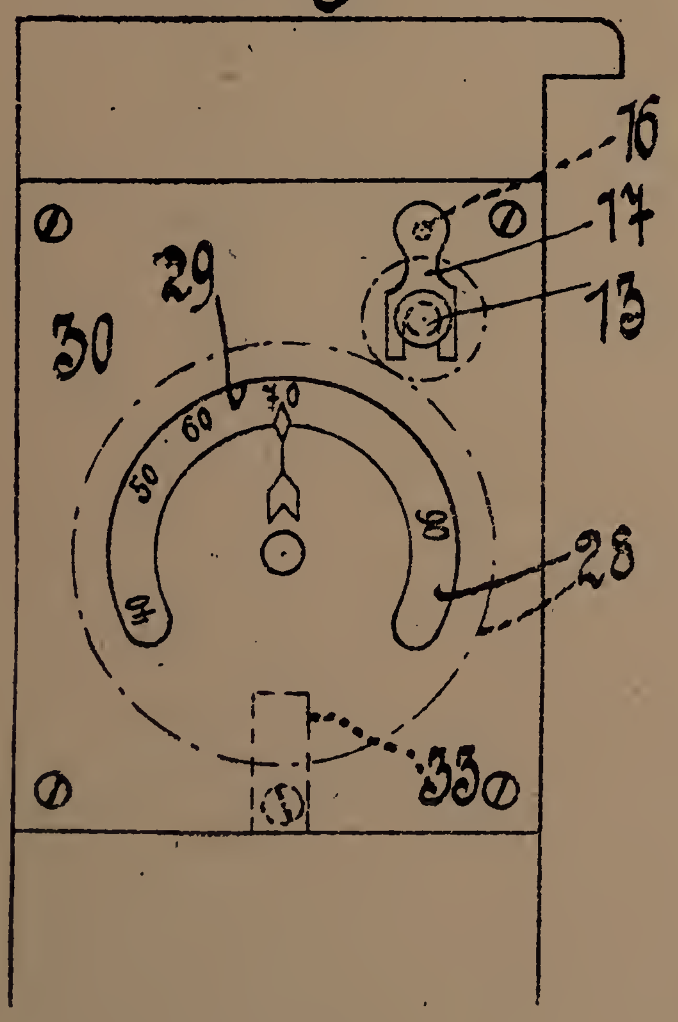


Fig. 4.

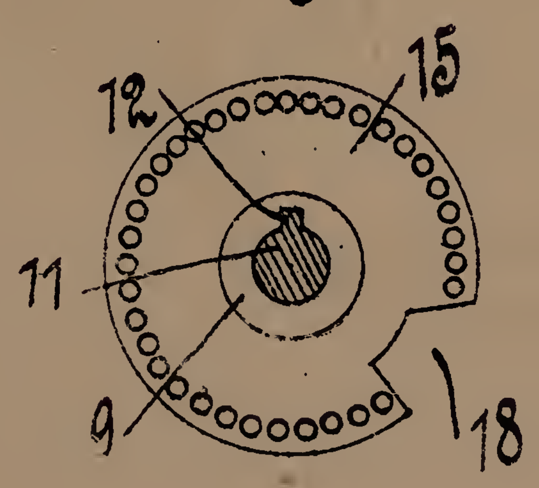


Fig. 3.

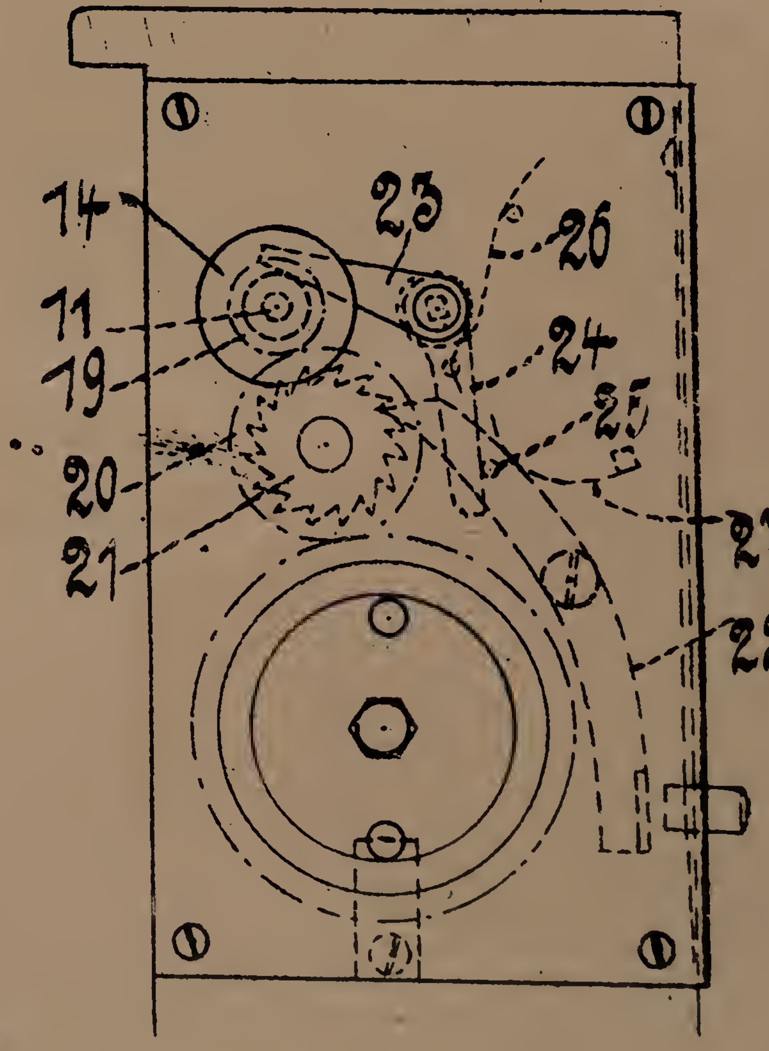


Fig. 5.

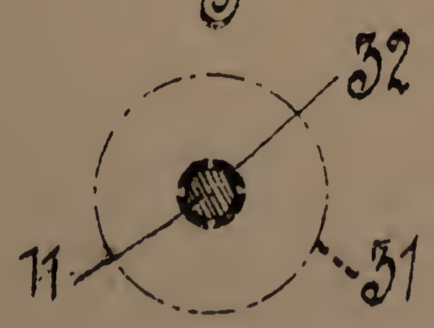
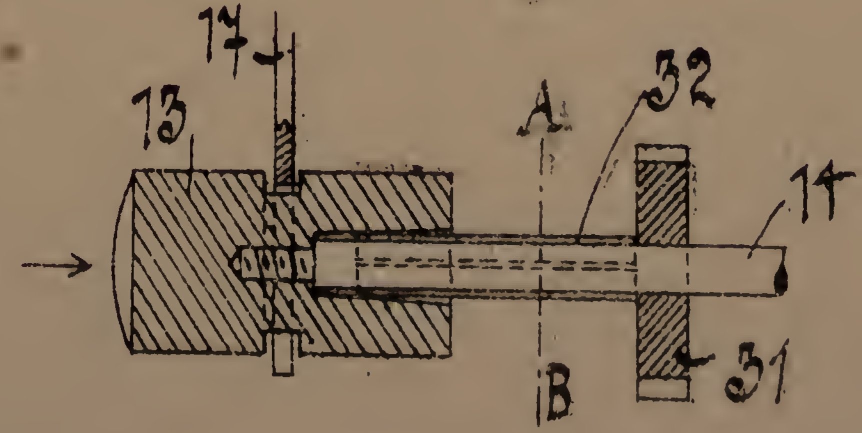


Fig. 6.



[This Drawing is a reproduction of the Original on a reduced scale.]

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